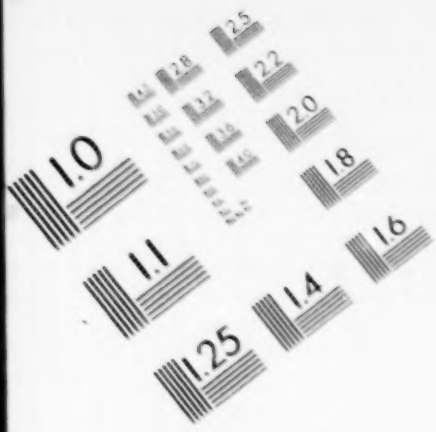

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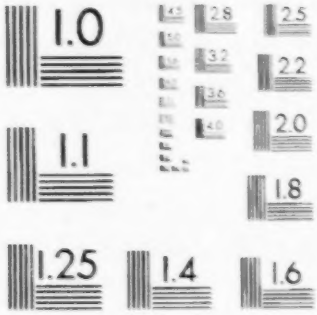

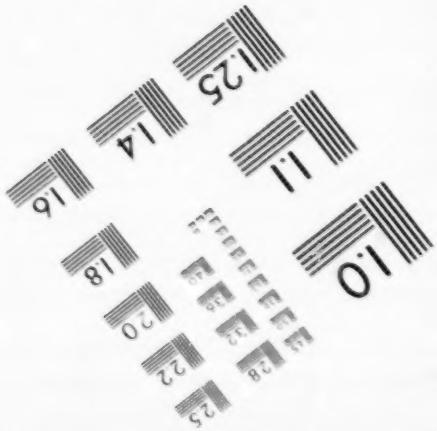

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The Project Approach: Three Avenues of Engagement

Ann-Marie Clark

Abstract

This paper examines the rationale of the spirit, material, and method of education behind the Project Approach. The paper describes some of the conditions and opportunities offered by project work that support children's dispositions to become lifelong learners and presents a model of three avenues of engagement for the mind of the child as it functions intellectually and socially within the contexts made possible by the Project Approach: curiosity, creativity, and communication.

The current demand for accountability in education circles places an emphasis on improving student performance on standardized tests. Scores on these tests represent numeric indices of children's acquisition of facts and the skills used to manipulate these facts. Debates focus on the allocation of minutes in teacher's schedules to particular subject matter in order to optimize the use of school time for increasing valued outcomes. With so much attention directed toward quantitative measures of teaching and learning in the current dialectics of educational discourse, the notion of the *quality* of children's life (time spent) in school seems almost inconsequential.

However, New (1998) reminds us that Dewey advised educators to consider closely the differences that the *spirit, material, and method of education* can make in the nature of the social life of schooling:

> To say that education is a social function, securing direction and development in the immature through their participation in the life of the group to which they belong, is to say in effect that education will vary with the *quality of life* [italics added] which prevails in a group. (Dewey, 1916/1966, p. 81)

New (1998) challenges readers to "reconceptualize our role as educators" as we "seriously debate the role of schooling in our contemporary and tumultuous society" (p. 280). Following the example of the schools in Reggio Emilia, Italy, she asks us to "direct more of our effort into imagining the possibilities within our own deficit-oriented society" to create a "new culture of childhood" (p. 280). Educators may then bring to the forefront of discourse issues surrounding the quality of "spirit, material, and method of education as it operates in different types of community life" (Dewey, 1916/1966, p. 81).

Issues of Quality

The intent of this paper is to participate in New's (1998) call for new discourse by reconceptualizing the quality of a child's life in school. It examines the rationale of the *spirit, material, and method of education*

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behind the Project Approach, as proposed by Katz and Chard (2000). My purpose is twofold: (1) to describe some of the conditions and opportunities offered by the Project Approach that support children's dispositions to become lifelong learners, and (2) to present a model of *three avenues of engagement* for the mind of the child as it functions intellectually and socially within the contexts created (or made possible) by the Project Approach.

The Project Approach is said to engage children's minds (Katz & Chard, 2000). Children's minds become engaged in good project work as they are given opportunities to investigate in depth worthwhile interests, solve relevant problems, and represent significant findings. Through this engagement, children may show increased motivation in their efforts to learn and in so doing have opportunities to develop the dispositions to become lifelong learners. This paper discusses three avenues of engagement that project work offers children: curiosity, creativity, and communication. Through each of these potent human processes, teachers are able to tap into children's inborn dispositions to make sense of their world. Engagement becomes a natural function of the classroom milieu created through project work.

Classroom Milieu of Engagement

In the classroom milieu of the Project Approach, the teacher is able to create an environment that nurtures the intellectual capabilities of the child's mind (Katz & Chard, 2000). Her purpose becomes to facilitate a "development from within … based on natural endowments" versus "a process of overcoming natural inclination and substituting in its place habits acquired under external pressure" (Dewey, 1938/1998, p. 1).

In their discussion of classroom milieu, Ryan, Connell, and Deci (1985) posit that the "idea that quality education represents" *development from within* rather than *formation from without* corresponds to an emphasis on *intrinsic* rather than *extrinsic* motivation (p. 14). Further, this attention to the quality of the milieu of schooling is shared by a "long tradition of educational theorists" including:

> Bruner (1962), Holt (1972), Montessori (1967), and Rogers (1969), who have argued that learning is a process of discovery rather than compliance. In their view, an academic environment facilitates rather than enforces education, and offers opportunities for learning rather than prods. This tradition assumes an intrinsic motivation to learn in children, an inherent tendency toward mastery and knowledge, which needs to be nurtured and supported. (Ryan, Connell, & Deci, 1985, p. 14)

Milieu and Mind

Dewey (1934/1980) cautions us that theories such as those that distinguish intrinsic from extrinsic motivation contribute to the more modern notion of "popular psychology and much so-called scientific psychology [which] have been pretty thoroughly infected by the idea of the separateness of mind and body" (p. 262). From this assumption, many argue that "mind, soul, and spirit can exist and go through their operations without any interaction of the organism with its environment" (p. 263).

For this discussion of the mind's engagement through project work, the reader is asked to consider Dewey's notion that, rather than "an underlying substance (or independent entity) that performs the activities in question" (p. 263), the word *mind* is a verb:

> Mind is primarily a verb. It denotes all the ways in which we deal consciously and expressly with the situations in which we find ourselves.... Mind is more than consciousness, because it is the abiding even though changing background of which consciousness is the foreground. Mind changes slowly through the joint tuition of interest and circumstance. (p. 266)

With this assumption of the definition of *mind*, the child holds or displays an interest in interaction with the circumstances created in the classroom. Therefore, the quality of learning can be viewed in direct proportion to that of the milieu for *minding*.

Teachers are primarily responsible for this quality milieu. For example, motivation to learn varies with the kinds of goals that teachers emphasize. In her research on the effects of different kinds of motivational processes affecting learning, Dweck (1991) reports that when an emphasis is on learning goals, rather than performance goals, children: (1) become

effort oriented, rather than ability oriented; (2) respond more magnanimously towards peers; (3) vary their strategies, with increased effort; (4) take more time, with increased recall; and (5) strengthen their disposition to learn. An emphasis on learning goals, rather than performance goals, is evidenced in the quality of project work (Katz & Chard, 2000).

Quality Matters

When addressing the question of the quality of children's life in school, it seems appropriate to focus attention on *exactly what children are asked to do*. Sitting still, listening to the teacher, answering questions, and following directions may be useful test-taking skills. However, if these activities form the majority of what children do in school, they may limit the role of the learner to that of a passive recipient of prescribed information.

Perhaps this passivity was well suited for graduates of schools in the last century charged with preparing a skilled industrial workforce. However, much more is required of today's graduates. Besides looking for graduates with high scores on individual tests of ability, employers seek motivated thinkers able to create innovative solutions to unexpected problems. Qualifications may include being skilled in asking questions, formulating hypotheses, making predictions, completing investigations, and organizing data—all while working well with others in a cooperative problem-solving group.

It follows that today's schools may better serve children by creating contexts to develop these abilities within the community life of the classroom. However, as evidenced in the recent presidential debates, the quantitative measures discussed at the beginning of this paper seem to take precedence in the discourse about schooling, especially at the administrative level. How children's time is spent in school is directly determined by those who control the allocation of school funds. In other words, time is money.

A Question of Time

Recently, during the first day of a university graduate class in community psychology, one of the professors, who is also a member of a local board of education, asked me for information about the Project Approach. The approach was adopted last spring by a new school in a low-income neighborhood in his district as a "schools-of-choice" theme. He said he wanted to address his colleagues' concerns about what children should be doing who already perform poorly (schoolwide) on standardized tests of basic skills: "They feel the children might be wasting valuable time doing projects. Shouldn't they be spending their time learning the basic skills?" (Thomas Moore, personal communication, August 23, 2000).

In addressing his question, I tried to emphasize the primacy of children's interests and their intellectual capabilities brought to the foreground through project work. I explained that it is in the *use* of basic skills that children achieve a level of mastery. I cited research (Marcon, 1992) suggesting that rigorous training in basic skills in early childhood may produce good results in the short run but may damage the disposition to achieve academically in the long run, especially among males of color.

Finally, I postulated that this result might be so because children may become bored with schooling that features a transmission model of standardized teaching and testing. I explained that it is not the intent of those who profess the implementation of the Project Approach to replace the teaching of skills with allowing children to wander aimlessly, following whatever captures their attention at the moment.

Rather, the approach is intended to capitalize on children's interests, giving them an opportunity to apply the skills they are learning while collecting and representing information on a topic worthy of their time and energy. Furthermore, perhaps as children pursue their interests while given an opportunity to formulate questions, make predictions, investigate resources, and represent findings to communicate to others what they discover, they might see the *need to use* the basic skills we want them to learn.

"That's enough," he said.

I noticed he had taken a half page of notes as I spoke. I began wondering how I could have better answered his question. I did not feel my response

was *enough*. I began to consider the nature and importance of engagement.

Engaging Children's Minds

Terms of Engagement

According to Katz and Chard (2000), there are four categories of learning goals, all of which are important: (1) knowledge (facts and concepts), (2) skills (units of behavior), (3) dispositions (habits of mind), and (4) feelings. Schools frequently focus on the first two categories, but the latter may seldom be taken into consideration when prioritizing goals for curriculum and instruction. Perhaps this focus mirrors the values of an educational system more concerned with extrinsic than intrinsic motivation, or the life of the child's mind.

From Motivation to Engagement. Katz and Chard (2000) have titled their book *Engaging Children's Minds: The Project Approach*. School board members, administrators, and teachers considering this approach may wonder what is meant by *engagement* in this context. Engagement is a slippery concept that may be more easily recognized when in operation than when theoretically defined. In other words, we may more easily know it when we see it!

Covington (1998) expresses a similar quandary in his discussion of motivation:

> Knowing *how* to motivate people is not the same as knowing *what* motivation is....Whatever is being aroused by the clever use of rewards and incentives—namely, motivation itself—remains mysterious and elusive. Motivation, like the concept of gravity, is easier to describe (in terms of its outward, observable effects) than it is to define. (p. 1)

Covington (1998) argues that school reform is ill served by the intensification policies of *more* hours in school, *more* homework, and *more* tests. He calls for alternative approaches to curriculum and instruction that offer an "opportunity for intrinsic goals to emerge in the course of daily work" (p. 140), so that "the act of learning is its own reward" (p. 19). It follows that when conditions favor the emergence or arousal of intrinsic motivation, however mysterious and elusive the process may be, children's minds are more likely to become engaged.

Becoming Engaged. Fried (1995) describes engagement as a necessary component of classroom dynamics for high-quality learning to occur:

> For students to *engage* is not what is usually called "time on task": responding to work-sheets, recalling facts or dates, or reading chapters of a text and answering questions at the end. I want students to engage the way the clutch on a car gets engaged: an engine can be running, making appropriate noises, burning fuel and creating exhaust fumes, but unless the clutch is engaged, nothing moves.
>
> It's all sound and smoke, and nobody gets anywhere. In too many classrooms, we see the sound and smoke of note-taking, answer-giving, homework-checking, test taking, and the forgetting that quickly follows. In the end, there is creativity and excitement for the few, compliance and endurance for most, rebellion and failure for some, but not very much work of high quality is being produced, and not much engagement of the mind and spirit takes place. (p. 46)

Engaging Interests. The state of engagement, *the condition of being in gear,* may become self-perpetuating because the child finds it satisfying. The child is said to be intrinsically motivated, as the continuation of thought or activity appears to be self-directed. When engaged, the child's mind is in a state that is ready to move in the continued pursuit of an interest.

Katz and Chard (2000) use the term *interest* to refer to "the disposition to pursue an activity or goal in the absence of coercion or expected rewards" (p. 38). They include in their definition "the tendency to become deeply absorbed enough in an activity to pursue it over an extended period of time, with sufficient commitment to accept its routine as well as novel aspects" (p. 38). This process of engagement with interest at least "in rudimentary form appears to be present in the normal human at birth" (p. 38).

However, they remind us that this inborn disposition to become engaged may be "affected by a variety of

social-psychological processes throughout childhood" (Katz & Chard, 2000, p. 38). It may be lessened or developed, as a tool of the child's *minding* for learning, as a result of surrounding conditions. Abuse, neglect, or even early pressure to excel academically can damage children's dispositions to develop intellectual capabilities. The classroom teacher bears the responsibility for providing the context to support the conditions for children to become, and continue to be, engaged at school.

Feeling Engaged. In his recent book *Teaching as a Performing Art*, Sarason (1999) argues that teachers must seek to involve their children much the same way that actors endeavor to engage an audience. Regarding the salient role of the teacher in the classroom:

> The maxim that teachers teach children, not subject matter, is not a downgrading of subject matter but a way of saying that if you do not understand where children are coming from in the classroom context, the intended meaning, significance, and utility of that subject matter may not be grasped. (p. 45)

He continues by commenting that feeling is a necessary, yet often unrecognized, component in the art of teaching, as well as other performing arts. He notes that Garrison (1997) reminds his readers in *Dewey and Eros* that:

> Dewey rejects a kind of faculty psychology which leads to a conception of learning in which thinking, feeling, and desire-passion are for all practical purposes in distinct realms of the learning experience in *student and teacher*. It is not a rejection on principle but rather on the basis that *they are never separate in experience.* (p. 45)

Sarason (1999) admits that even though the word *passion* is one "we ordinarily do not associate with teaching" (p. 45), nevertheless "it was implicitly and explicitly central to Dewey's conception of learning and thinking" (p. 45). From this perspective, it seems clear that Dewey's ideas about learning from direct experience do not discount the feelings that accompany the learning situation.

Engaging Feelings. Feelings can be thought of as being inextricably mixed with thinking and learning. Children working on projects have many opportunities to experience positive feelings. These opportunities include: (1) a sense of belonging to a group engaged in purposeful work, (2) a sense of acceptance in making a meaningful contribution to the narrative discourse of the classroom, and (3) a sense of competence in developing the disposition to use their intellectual capabilities in applying and strengthening academic skills. These positive feelings help to nurture children's confidence in their intellectual abilities as they develop the disposition to become lifelong learners (Katz & Chard, 2000).

Habits of Engagement

Engaging Habits. Dispositions are considered to be habits of mind that may be nurtured, extinguished, or damaged according to how they are affected in the learning situation. Ignoring feelings that accompany the learning process may damage the disposition to learn. For example, Katz and Chard (2000) remind us that having reading skills and having the disposition to read are entirely different. Often the latter can be lost or damaged at the expense of the former through an overemphasis on drill and practice of isolated skills or meaningless content.

However, teachers can choose to recognize the importance of nurturing such dispositions as a learning goal. For example, good project work capitalizes on the natural disposition to investigate:

> All of us are born with the disposition to learn. It is the intellectual disposition to make sense of experience. The very young are natural born anthropologists and social scientists. Early childhood specialists say that children learn through play. It is just as natural to learn through observation and investigation (Katz, personal communication, September 12, 2000).

Developing Habits. Cuffaro (1995) reminds us that "while we are accustomed to thinking of *habit* as actions that are repetitive, mechanical, routine, as our dichotomized 'good' and 'bad' habits...the word as used by Dewey is the antithesis of the routinized, mechanical, and passive" (p. 18). Rather, his approach was to characterize habits as "active, assertive, insistent, dominant, immediate" (p. 19). Therefore, our habits are ways of perceiving, reacting, and

thinking about what we do and what happens to us as we experience life.

According to Cuffaro (1995) the development of habits is a growth process—the capacity for plasticity that enables us to learn from experience. Within this process of trying and discovering, modifying and adapting, habits are formed and dispositions develop:

> Habits represent the selections we have made in our encounters with the environment, the choices that guide and lead our actions.... To be inclined, predisposed, speaks to the influence of prior activity, to preferences and meanings acquired over time. Habits reflect the continuity of self in time. They tell the story of our experiences and experiencing. Even when not used, habits are present in latent form in all that we do. Habits affect each other. They do not stand as discrete units of behavior or response. Habits interact and combine. They reinforce each other and interpenetrate. (Cuffaro, 1995, p. 19)

Forming Selves. For Dewey (1934/1980), as dispositions are formed and reformed through further interactions with the world, they become the formation of character as the interpenetration of developing habits form the self:

> The world we have experienced becomes an integral part of the self that acts and is acted upon in further experience. In their physical occurrence things and events experienced pass and are gone. But something of their meaning and value is retained as an integral part of self. Through habits formed in intercourse with the world, we also inhabit the world. It becomes a home and the home is part of our every experience. (p. 104)

Keeping in mind that for young children a major part of their time is spent in school, it may be prudent to consider the nature of the habits being fostered in their classrooms. What kinds of feelings are they experiencing? Are their minds becoming engaged in their work? Are they developing dispositions to become lifelong learners?

Teachers who become sensitive to these issues can use the Project Approach to create conditions that arouse positive feelings toward school and generate a context for strengthening children's dispositions to learn. Through good project work, children have opportunities to become engaged while investigating, problem solving, and representing. These kinds of activities tap into at least three potent processes that appear to be inherent aspects of human nature: curiosity, creativity, and communication. Within the context of good project work, these processes become *avenues* (means of access) *of engagement.*

Three Avenues of Engagement in the Context of Projects

Projects as Context

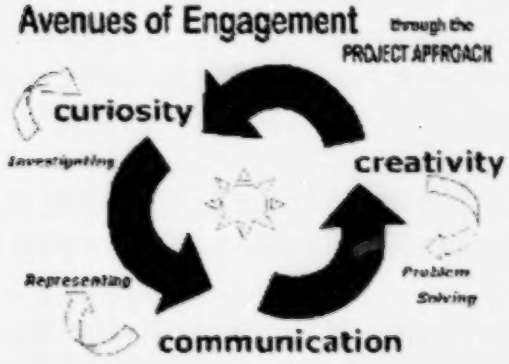
Avenues in Context. The Project Approach provides a context that offers opportunities for children's minds to become engaged through three compelling characteristics of human nature—curiosity, creativity, and communication. Each avenue becomes a *means of access* to inherent aptitudes that set into motion the mysterious processes of *minding* in the continued pursuit of an interest (described above).

Katz and Chard (2000) describe projects as stories, with a beginning, middle, and end that correspond to the three phases of projects. Each phase can also be seen as corresponding to one of three main elements of project work—content, process, and product. Just as the phases overlap, and the three elements pervade each phase, the avenues of engagement also come into play throughout the course of the project. However, for simplicity in the discussion that follows, each avenue will be considered in terms of an activity salient to a corresponding phase: (1) in phase one, investigating content engages the desire to understand—curiosity; (2) in phase two, the problem-solving process engages the desire to imagine—creativity; and (3) in phase three, the representing of information in products engages the desire to share or impart one's ideas to others—communication.

Model of Context. The reader is referred to the model in the figure below. An epistemological assumption underlying the Project Approach is that a normally developing child comes into the classroom with inborn intellectual proclivities. As Greene (1995) states, "We are first cast into the world as embodied beings trying to understand" (p. 73). The radiant

circle in the middle of this model of the dynamics of the process of engagement in human consciousness represents this *embodied being*.

The arrows in the outermost region of the model represent the kinds of intellectual tasks—investigating, problem solving, representing—offered to children throughout the context of project work. These intellectual capacities are variously involved as children are engaged in: (1) completing memory drawings; (2) writing and illustrating personal stories; (3) doing observational drawings and taking notes during fieldwork; (4) conducting surveys; (5) interviewing visiting experts; (6) consulting secondary resources; (7) organizing information in murals, posters, charts, pictographs, Venn Diagrams, models, or skits; and (8) preparing and sharing information as a culminating event with parents and peers.



Between the context arrows and the inner sphere of consciousness, the three wide arrows are intended to represent the three avenues (means of access) of engagement through curiosity, creativity, and communication. These represent some of the *mysterious and elusive processes* that come into play during *minding*. The arrows represent the dynamics of the interchange of forces from within (the child) and without (the environment) in an attempt to show how a child's mind (minding) may come to be engaged in the milieu of the Project Approach.

The dynamic processes and the spherical imagery suggested by the model take their origin from the almost lyrical *analysis of thinking* by Vygotsky (1987), who stated:

> Thought ... is not born of other thoughts. Thought has its origins in the motivating sphere of consciousness, a sphere that includes our inclinations and needs, our interests and impulses, and our affect and emotion. The affective and volitional tendency stands behind thought. Only here do we find the answer to the final "why" in the analysis of thinking. (p. 282)

Minding in Context. In the context of project work, the child's thinking, feeling, and acting are integrated through the dynamics of cognitive, social, and emotional interchange. As Rogoff (1990) posits, "the traditional distinction among cognitive, affective, and social processes becomes blurred once we focus on thinking as the attempt to determine intelligent means to reach goals" (p. 9). It may be reasonable to assume that children combine the use of all of these processes as they work individually and in concert to reach their respective and collective goals in project work. In the context of project work, children may become engaged through the *affective and volitional tendencies* of curiosity, creativity, and communication that *stand behind thought* in their *minding*.

Curiosity

Curiosity appears to be an innate characteristic of humans that drives the act of *minding*, necessary for survival. According to Covington and Teel (1996), curiosity expresses itself in three *manifestations* of the mind: (1) *question asking* through inquiring, probing, and speculating; (2) *sensitivity* to detecting mysterious, puzzling, and inconsistent facts or situations; and (3) *problem finding* through recognizing an unspoken need or anticipating a potential but still unnoticed danger (p. 72).

Asking Questions. As young children become more proficient in oral language, they seem to have a natural proclivity for asking questions: What is that? Can I see? Can I touch it? Why is it dark? Where are you going? This insatiable curiosity springs from an inborn desire to seek information—an internal craving that pushes humans to try to make sense of their surroundings. However, this proclivity may become latent in children who spend endless hours following directions to complete tasks deemed important by others. Even so, as a fundamental drive for the construction of understanding, curiosity does not disappear.

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Curiosity and Learning. According to Piaget (1970), when children notice something in their surroundings that doesn't fit the scheme of things as they understand them, a state of disequilibrium is generated. Piaget refers to these as *perturbing* events. This state can create a sense of uncertainty, or disequilibrium, that for most children may cause a feeling of discomfort.

According to Piaget (1970), the disequilibrium causes the child either: (1) to ignore the information that does not fit, (2) to take in a part of the information so that their understanding may be changed but distorted or incomplete, or (3) to change the existing scheme of things (accommodation) so that the new information can be understood (assimilation). Piaget was widely criticized for his linear view of this process.

In his later years, he struggled with the problem of linearity and explained that equilibrium was in a constant state of flux. To Piaget (1975/1985), the state of disequilibrium *motivates the act of seeking,* which in turn sets into motion the processes that will bring about a state of reequilibrium:

> It appears to us that in explaining cognitive development ... the concept of improving or optimizing equilibration imposes itself as fundamental. Our effort here has consisted in seeking the mechanisms of such equilibration, the problem being to take account of its two inseparable dimensions. On the one hand it involves compensation of perturbations responsible for the disequilibria that motivate seeking. On the other, it involves the construction of the new factors producing improvement. (p. 139)

From Disequilibrium to Equilibrium. It is the curiosity brought on by a state of disequilibrium that *motivates the seeking* as the child notices something that doesn't fit with the known. In the noticing, the child's mind tries to relate new information to what it already understands. It searches memories to make possible connections. The brain alerts the body to utilize the senses to gather more information. The child becomes compelled to reach out, to touch, to listen more intently, to look more closely, and even to smell or taste in order to make a better determination of the quantity and qualities of the unknown. The mind then uses the new information to compare it with existing categories—it is more like this, somewhat like that, and not like something else.

Curiosity in Projects. Project investigations include formulating and asking questions about topics of interest to the child. All this activity is driven by curiosity, which serves as an avenue of engagement for this natural engine of learning. The child's mind seeks to identify, label, categorize, classify, and bring a sense of order to experience in an effort to comprehend whatever it apprehends.

When children are given time to ponder, investigate, ask questions, and reflect, their sense of wonder can flourish, and their disposition to be curious is less likely to become latent. Furthermore, children's curiosity may be piqued if the outcomes of some tasks are not always certain (Covington, 1998). For example, when children are given the opportunity to make predictions before completing experiments or interviewing visiting experts, they become curious to see if their predictions are correct. As their inborn disposition to be curious is engaged, they are likely to experience positive feelings as their curiosities are satisfied.

When Einstein talked about curiosity, he said that it had its *own reason for being,* and when pressed for describing his genius, he added that he had no special talent, that he was only passionately curious. According to Einstein, "problem-finding is the highest form of curiosity" (Covington & Teel, 1996, p. 72). Asking questions, making predictions, or finding problems to solve require creative thinking, another avenue of engagement for children's minding in project work.

Creativity

Creative thinking is an inherent human process that can be developed when given proper guidance. Young children do not often say that they are not creative, as do most adults. Children's lack of inhibition when given opportunities to be creative may serve as evidence that the disposition to be creative can indeed be damaged. It is recognized as a universal of human nature. The disposition to be creative is manifested early in the life cycle but may not be as fully developed or appreciated across different cultures (Gardner, 1993; Torrance, 1995).

Creative Thinking. According to Torrance (1995), creative thinking is its own reward. It is usually

characterized as imaginative, original, expressive, and productive. It is another of the elusive and mysterious processes of *minding*, but "becomes evident in...scientific theories, inventions, improved products, novels, poems, designs, paintings, and the like" (p. 24). It may often be best noticed in everyday life in the act of problem solving. "Whatever creativity is, it is in part a solution to a problem" (Aldiss, 1990, p. 53).

Torrance (1995) began to study creativity in schooling in 1958. Creativity became a popular item on the national education agenda when the Russians launched *Sputnik* in 1957 in hopes of increasing the chances of the United States to win the *arms race* during the cold war. But for Torrance, nurturing the development of creative thinking is important, not only to the next generation of scientists, but also to increasing: (1) mental health in children's personality development, (2) the acquisition of information, and (3) the application of knowledge to daily problems.

Creative Problem Solving. Torrance (1995) explains the dynamics of creative thinking as similar to Piaget's process of disequilibrium. He describes a feeling of dis-ease when something is noticed as lacking. This uncomfortable feeling persists as humans look around to find a solution for whatever is bothering them. It is only when an answer has been found to solve the annoying problem that *the minding* can return to a state of relative ease.

The act of problem solving becomes satisfying. Some humans seek out these kinds of situations more readily than others. They become the risk takers. Those with an abundance of problem-solving energy may find satisfaction through the creation of art. The meanings expressed become extensions of the self. May (1975) contends that the creative process is *superational*, bringing into play emotional, intellectual, and volitional functions simultaneously in high-level thinking as an expression of self-actualization. An intense absorption with, and a heightened awareness of, a problem often characterize children working on projects.

Creativity in Project Work. Torrance (1995) defines creativity as "the process of forming ideas or hypotheses, testing hypotheses, and communicating the results" (p. 23). This threefold process defines the purposes of the three phases of project work. As students begin to formulate questions, original thinking is encouraged.

In project work, children may choose what they wish to investigate and how they want to represent their findings. Both of these opportunities provide a context for children to think about and produce something of their own creation. In this context, the children's original thoughts are honored. The child's desire to communicate meanings to others through the representations of their findings can be tapped as a motivating force. Thus, communication forms another avenue of engaging their minding.

Communication

Symbol Making. The inclination to communicate appears to be an inborn characteristic of human nature. Bees are able to dance patterns that communicate to other bees in the hive where honey is located miles away, birds sing to mark their territories, and chimps can produce patterns of American Sign Language. However, only humans can create symbols to hold memories of meanings important for future reference. Children learn to use symbols to communicate to others what is meaningful to them. Meaning making, therefore, seems to lie somewhere on the border between experience and representation, where the reality of experience spills into children's representations of meaning in the symbols they create (Gubrium & Holstein, 1997).

In project work, children are encouraged to negotiate with the teacher how they are going to represent what they have learned. The teacher may ask, "How would you like to show others what you know?" The child may choose from a variety of forms of representation including murals, plays, books, dioramas, mobiles, models, flowcharts, pictographs, maps, and Venn diagrams. When a child chooses to create a representation of the information discovered through the inquiry process, it is reasonable to assume that the representation holds the meanings he or she wishes to communicate.

The Social Individual. Dewey describes the self as a social individual. Although each person is unique, that uniqueness is only realized in relation to others. Children come to understand themselves in the world through their interactions with others. When they

work together with others, they realize their potential as they endeavor to communicate their needs in relation to their strengths.

In traditional classrooms, children usually work in isolation from others. They are sometimes chastised for coming to the aid of their classmates. Teachers have a hard time keeping children from communicating with their peers while they are completing assignments. Often observers will notice that the children seem to have their own agenda of socializing. At times they will pursue this agenda quietly while maintaining an eye on the teacher as she pursues her own agenda. Observers hear teachers asking, "Are you working or talking? Did I give you permission to talk?" Sometimes children will persist in their social agenda, even under threat of banishment to a time-out corner!

Kagan (1997) advises teachers to use this interest in communication to foster collaborative work environments in the classroom. The research on the effectiveness of cooperative learning processes in the acquisition of knowledge and the creation of new learning abounds (Kagan, 1997; Johnson, Johnson, & Holubec, 1994; Sarason, 1990). When teachers use cooperative learning structures in concert with the Project Approach, learning can increase exponentially.

Communication in Project Work. The Project Approach offers a context in which children can work together in small groups to complete their investigations and representations. In this context, the children's and the teacher's agendas may converge. Children may disagree, but they have a vested interest in working out solutions to their problems. Their work becomes purposeful as they collaborate toward a common goal. If the teacher has to intervene, it may be to help them identify options and explore the pros and cons of various alternatives. In this way, the teacher is able to harness the desire to socialize, together with the motivation to form a meaningful product, through collaboration.

This meaningful interaction is known as *child cross talk*. The children have many opportunities to share their ideas as they work together and then to share what the group has created with the rest of the class. During the course of the project, as children complete a significant piece of their investigations or representations, the teacher might ask them to share their work in progress. This sharing gives them an opportunity to teach the other children what they have learned in their small group and receive feedback on the accuracy and clarity of their work. Not only do the children have an opportunity to rehearse what they are thinking about, but this process also offers a context for learning how to give and receive constructive criticism.

In the final phase of the project, children gather what is most salient to their new understandings to produce a display for parents and peers outside the classroom. In the process, students are given an opportunity to self-assess what is worthy of sharing. From the many opportunities they have had to listen to other children present their work in progress, they are able to explain other children's work to their parents. The culminating event gives children, parents, and others an opportunity to participate in increasing the quality of the community life of the group.

Conclusion

Through this discussion, I have tried to show how the Project Approach can contribute to the development of positive dispositions and feelings in children. In harnessing the potential of inborn tendencies to be curious, creative, and communicative, teachers can create a context for children to have positive experiences in purposeful thinking as they become engaged in project work in school.

When law makers, administrators, and teachers come together to make decisions about how children's time is to be spent in school, perhaps they will take into consideration the (nonstandardized) nature of children. Perhaps they will consider questions of quality as well as quantity. Perhaps they will consider how important children's feelings are to developing good mental health and will adopt a mind-set toward creating environments that foster intellectual, as well as academic, capabilities. As Dewey reminded us, the purpose of education is to develop in each child the dispositions necessary to become a lifelong learner.

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